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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,367	10/03/2003	Noureddine Melikechi	DSU-102US	4029
31344	7590	04/07/2005		EXAMINER
RATNERPRESTIA			DUPUIS, DEREK L	
P.O. BOX 1596				
WILMINGTON, DE 19899			ART UNIT	PAPER NUMBER
			2883	

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/678,367	MELIKECHI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Derek L. Dupuis	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
 THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-8 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 10/3/2003 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>1/14/2004</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 1/14/2004 has been considered by the examiner.

### ***Specification***

2. The disclosure is objected to because of the following informalities: in lines 23-25 the specification includes a reference to an “appendix A”. This reference should be removed from the application as an appendix is not an appropriate part of the specification. Appropriate correction is required.

### **Content of Specification**

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), “Sequence Listings” (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.

Or alternatively, Reference to a “Microfiche Appendix”: See MPEP § 608.05(a). “Microfiche Appendices” were accepted by the Office until March 1, 2001.

(e) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:

- (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
- (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

(f) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(g) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.

(h) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(i) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations

to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

- (j) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (k) Sequence Listing: See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

#### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 7 recites the limitation "a third one" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim. For the purpose of examination, the examiner has interpreted this limitation to mean "a third phase shifting element".

6. Claim 7 recites the limitation "the channels" in line 3. There is insufficient antecedent basis for this limitation in the claim. It is unclear whether this limitation is intended to mean the converging channels, the diverging channels, or the parallel channels. For the purpose of examination, the examiner has interpreted this limitation to refer to the parallel channels.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Sriram et al (US 6,600,843 B2)*.

9. Regarding claim 1, Sriram et al teach an optical modulator as shown in figure 5. The device includes a radiation input end (14) connected to a radiation output end (22) through first (44) and second (46) diverging and third (36) and forth (70) converging radiation paths. The third and forth radiation paths converge at an angle  $\theta$ . The angle  $\theta$  results in an exiting radiation interference pattern at an interference zone outside of the output end (see column 7, lines 25-37). The interference pattern can have a primary constructive interference fringe (see column 7, lines 25-37). The modulator also includes a phase shifting element (16, 16', 18, 18', and 18'') in at least one of the diverging or converging radiation paths with an analog modulator connected to the phase shifting element (see column 7, lines 10-59).

10. Sriram et al do not teach that the angle  $\theta$  is calculated to maximize the energy transfer efficiency of the optical field amplitude between the entering beam and the receiver input end by matching the interference fringe spatial mode to the radiation receiver input end mode. It would have been obvious to one of ordinary skill in the art at the time of invention to calculate the angle  $\theta$  to result in a maximized energy transfer efficiency, since it has been held that discovering (or

calculating) an optimum value of a result effective variable involves only routine skill in the art.

*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

11. Regarding claim 2, Sriram et al teach an optical modulator as discussed above in reference to claim 1. Sriram et al show in figure 5 that the radiation passing through the modulator is a light which is a type of optical radiation.

12. Regarding claims 3 and 4, Sriram et al teach an optical modulator as discussed above in reference to claims 2 and 1, respectively. Sriram et al teach that the optical paths are solid state waveguides which are solid state optical channels.

13. Regarding claim 5, Sriram et al teach an optical modulator as discussed above in reference to claim 2. Sriram et al teach that the radiation is emitted by a laser (see column 7, lines 10-14). While Sriram et al do not teach that the laser is integral with the modulator, it would have been obvious to one of ordinary skill in the art at the time of invention to make the laser integral to the modulator, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art.

*Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

14. Regarding claim 6, Sriram et al teach an optical modulator as discussed above in reference to claim 1. Figure 5 of Sriram et al shows two parallel channels disposed between the first and second diverging paths and the third and forth converging paths.

15. Regarding claim 7, Sriram et al teach an optical modulator as discussed above in reference to claim 6. Figure 5 of Sriram et al shows a phase shifting device in each parallel branch (16 and 16') and a third phase shifting device (18'') between the branches. These phase

shifting devices are connected to an analog modulator driver and operates in a push-pull configuration (see column 7, lines 10-59).

16. Regarding claim 8, Sriram et al teach a method for modulating and coupling a radiation beam to a receptor input end. As shown in figure 5, a radiation beam is split into first and second substantially equal intensity beams propagating along first and second solid state equidistant diverging channels. The split beams are directed along third and forth channels that converge at an angle  $2\theta$ . The two channels terminate at output coupling location 54 where the output channel 22 begins. An interference pattern is formed in an interference zone at the output coupling location. The interference pattern has at least one constructive interference fringe (see column 7, lines 10-37). Sriram et al teach altering the optical field amplitude incident on the receptor input end by applying an analog modulating signal to shift the phase of at least one of the beams and laterally shifting the position of the constructive interference fringe across the input end of the receptor (see column 7, lines 10-59).

17. Sriram et al do not teach that the radiation input end is positioned at a point where the constructive interereference fringe mode matches the first receptor input mode. It would have been obvious to one of ordinary skill in the art at the time of invention to position the radiation input end at a point where the constructive interference fringe mode matches the first receptor input mode to result in maximum transfer efficiency, since it has been held that discovering (or calculating) an optimum value of a result effective variable involves only routine skill in the art.

In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

### *Double Patenting*

18. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

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improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

19. Claims 1-5 and 8 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 and 25 of copending Application No. 10678368 in view of Sriram et al. Claims 1-5 and 25 of application number 10678368 include the same limitations as claims 1-5 and 8 of this application with the exception of the phase shifting element. Sriram et al teach an optical modulator as discussed in the above rejection under 35 U.S.C. 103(a). Claim 1 of the Sriram et al patent includes the limitation of a phase shifting element in at least one branch and an analog modulator connected to the phase shifting element. It would have been obvious to one of ordinary skill in the art to modify the modulator of the '368 application by including a phase shifting element as taught by Sriram et al because Sriram et al teach that this element is common in an MZ modulator (see column 1, lines 10-56).

This is a provisional obviousness-type double patenting rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L. Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Friday 8:30am-4:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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